Checkout Launch and Control System (CLCS)

Juno Integration Plan

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1.0 Scope

This document defines the integration plan for the Juno development and delivery of the Checkout and Launch Control System (CLCS).

2.0 Description

The integration effort for the Juno delivery will differ from subsequent deliveries, because much of the target system does not yet exist. Normal integration procedures will be established in the Redstone delivery time frame.

This document will outline the process of collecting and placing under configuration management the released software developed at Johnson Space Center (JSC) and Kennedy Space Center (KSC), installing the software on multiple platforms, and performing system level integration in preparation for system testing of the Juno delivery.

3.0 Applicable Documents

Document Number	Description
N/A	National Launch Processing System (blue book)

4.0 Juno Integration Description

4.1 Configuration Management/Build

4.1.1 Software Configuration Management

For the Juno delivery, a software configuration management tool will not be in place. Therefore, the thread leads will deliver to the Juno configuration administrator a tape (4 mm) consisting of Juno software deliverables in the directory structure shown in Figure 1.

Along with the tape, thread leads will provide documentation containing tape contents along with directions necessary to install the delivered software. In addition, a copy of the procedures used to test subsystem functional requirements will accompany the delivered tape. Open issues or problems at the completion of AITs should be documented and forwarded to system integration.

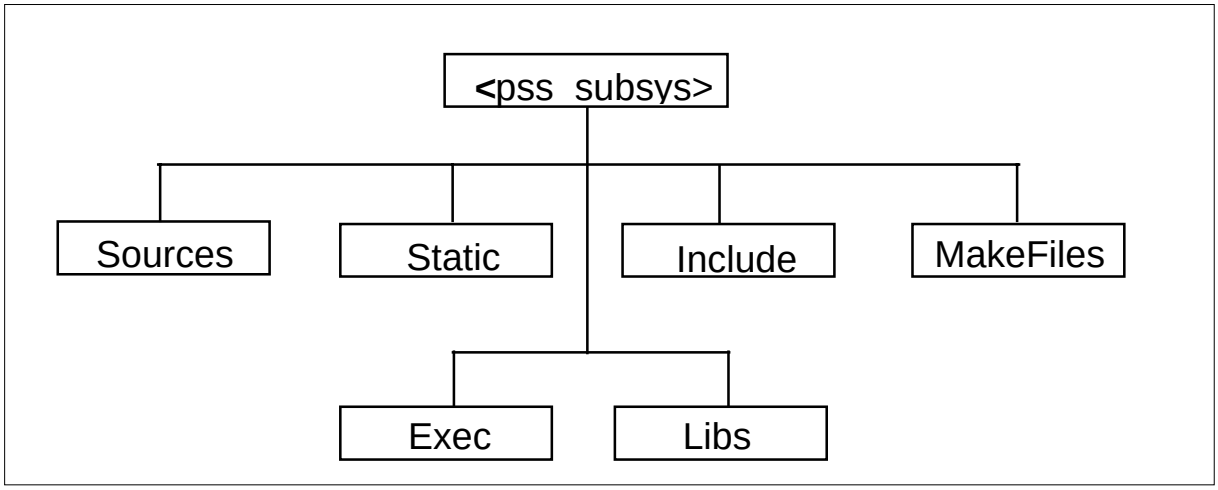

Figure 1. Directory Structure

The tapes will be recorded using the CM software catalog procedure (Appendix A). Two copies will be made and labeled Master b/u and copy. These tapes and associated documents will be stored in a locked cabinet.

4.1.2 Hardware Configuration Management

For hardware configuration management, a detailed list of the equipment on the network for the Juno delivery will be provided. This list is to include type of hardware, firmware revisions, and status (temporary, permanent).

4.1.3 Build

There are three separate build processes to be established for CLCS: development builds, system builds, and TCID builds. Development builds are those necessary to perform unit and unit integration testing of a CSCI, and will be performed by the responsible development organizations. System builds will create a build of all system and application services software, and will be performed by the CM/Build group. TCID builds will incorporate products (OLDB, etc.) into a system build to make a complete operational system, and will be performed by the CM/Build group.

Products for the Juno delivery will be developed at two separate locations: KSC and JSC. Development build activity for JSC developed products will be provided by the LMSMSS Configuration Management Office (CMO) at JSC, and by development support on a target platform after delivery to KSC. Development build activity for KSC developed products will be performed by development personnel. No system or TCID build processes will be performed for the Juno delivery.

4.2 Software Installation

The software installation for Juno will not be handled by system integration. The group responsible for the development of each software system will be accountable for the installation on the required platforms. System integration will coordinate with the responsible personnel for installation of software prior to system integration activities.

4.2.1 Operating System Software

All aspects of the operating system software will be handled by the Operating System (OS) group. This group will perform configuration management and load the operating system software on all required platforms. Refer to Appendix B for the point of contact for the OS load.

4.2.2 Platform Services Software

Installation of the platform services software will be the responsibility of the individual(s) listed in Appendix B .

4.2.3 Applications and Displays Software

Installation of the application and display software will be the responsibility of the individual(s) listed in Appendix B.

4.3 Juno Integration

The integration effort for the Juno delivery will be limited with respect to the subsequent deliveries. The main integration effort will involve the testing of software products in the Software Development Environment (SDE-1) and the LCC-X HCI Testbed, using procedures developed by the individual software development groups. Figure 2 provides a high level overview of the integration time frame for Juno.

KSC developed products will be delivered to the System Integration section via tape at the end of the delivery cycle. JSC Mission Control Center (MCC) services software will be delivered to KSC in three separate drops (Refer to Figure 2). The first drop will include the majority of the system services provided presently at mission control in JSC. The second drop will include enhancements, while the final drop will be a formally tested version.

4.3.1 Software Development Environment (SDE-1)

Integration of KSC and JSC developed products will initially be performed in the SDE-1, currently located in the Engineering Development Laboratory (EDL). After software is successfully loaded on the target platforms, system integration will test the products using procedures written by the development organizations (KSC and JSC).

System Test personnel will work closely with system integration during this checkout period, performing dry-run of their system test procedures.

4.3.2 Launch Control Complex (LCC-X) HCI Testbed

After successful integration in the SDE-1, software products will be tested in the LCC-X HCI Testbed. The same procedures used in the SDE will be used in the LCC-X checkout where practical. System Test personnel will also be involved during this checkout.

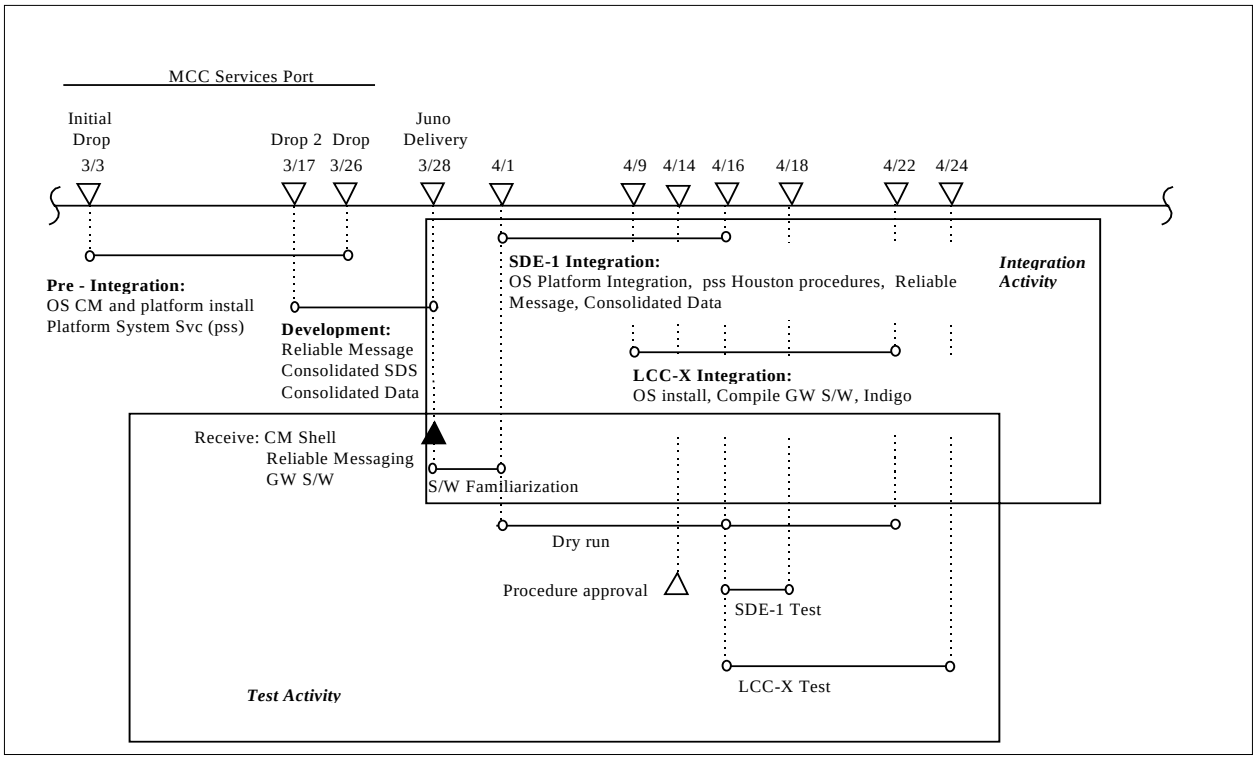

Figure 2. Juno Integration and Test Schedule

Appendix A - CM Software Catalog Procedure

The purpose of this document is to label and track incoming SW until a configuration management system is in place. The incoming SW will be recorded and the tape will be issued a catalog number.

Al Menedez is the CM administrator; however, for Juno, system integration will collect, record, and store the deliverables until a CM process is in place.

The CM administrator will make two copies of the original tape to provide for two masters and one copy. One master will be locked in a remote location for safe keeping while the other master and copy will be held by the CM administrator. The CM administrator will allow check out of the copy for use.

CM Software Catalog Procedure:

1. Receive SW (tape)

2. Verify the following is present:
    a) Document containing list of tape contents
    b) Copy of procedures used to test subsystem functional requirements
    c) Instructions to install SW

3. Assign and label a catalog number to the tape. Label the tape **Master.**

4. Record the following on the CM Catalog:
    a) Date received
    b) Delivery (Juno)
    c) SW version
    d) Tape number (assigned by CM administrator)

5. Make two copies of the tape
    a) Label one tape: **Master b/u**
    b) Label one tape: **Copy**

6. Store the Master b/u in a remote location (TBD). Store the remaining master and copy in the temporary CM cabinet.

Appendix B - Software Installation Matrix

Juno Point of Contact

	CS SDS GW (LCC)	CS Data GW (LCC)	DDP (SDE-1)	HCI (LCC-X)	HCI (SDE-1)
O/S Install	S. Quinn	S. Quinn	O. Brooks	O. Brooks	O. Brooks
GW S/W	S. Quinn	S. Quinn	N/A	N/A	N/A
Services	N/A	N/A	O. Brooks	O. Brooks	O. Brooks
Network Services	J. Porter	J. Porter	J. Porter	J. Porter	J. Porter
Applications / Displays	N/A	N/A	N/A	S. Siemiensky	S. Siemiensky

Appendix C - Acronym List

AIT	Application Integration Test
CLCS	Checkout and Launch Control System
CM	Configuration Management
CMO	Configuration Management Officer
CSCI	Computer Software Configuration Item
EDL	Engineering Development Laboratory
HCI	Human Computer Interface
JSC	Johnson Space Center
KSC	Kennedy Space Center
LCC	Launch Control Center
LMSMSS	Lockheed Martin Space Mission System and Services
MCC	Mission Control Center
OLDB	On Line Data Base
OS	Operating System
SDE	Satellite Development Environment
SW	Software
TCID	Test Configuration Identification